KENNER. (ROBT. C.)

THE TREATMENT OF

INTERMITTENT FEVER

BY

ROBERT C. KENNER, A.M., M.D.

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THE TREATMENT OF INTERMITTENT FEVER.

The treatment of intermittent fever calls for remedies directed to the relief of the issues of the paroxysm itself, and the prevention of future attacks.

It is a view commonly entertained that the febrile attack demands little or no treatment, unless one or all of its stages be unusually protracted, or attended with symptoms or complications of a severe or dangerous nature. So great an observer as Hertz thinks the treatment of ordinary intermittent fever calls for no more than "to require the patient to take to bed, and be kept from injurious influences."* Yet to me remedial interference has always seemed of primary importance, because dangerous complications frequently attend the unfolding of the stages of the paroxysm, while the shock and the exhaustion that follow it are by no means a light matter. The late Prof. Bemiss considered the treatment of the paroxysm impor-

*Hertz in Ziemssen's Cyclopedia, Vol. II, p. 658.

tant. He says, "However little the danger to life is from the paroxysm of a simple intermittent attack, the practitioner should not forget that whatever danger does exist is to be ascribed to damage suffered during or in consequence of the chill."*

Sternberg says, "The sensations of the patient during the *cold stage* seem to furnish an indication for the *treatment*." He advises against the piling on of excessive bed-clothing, and says truly, patients should be lightly covered, and only sufficiently to protect from draughts. Hot bottles should be applied to the feet and warm irons laid against the spine. Very little water or other fluids should be allowed in this stage. Even warm drinks, recommended by some authors, have often proved harmful in my hands by exciting vomiting soon after being swallowed, or later on in the paroxysm. Besides these measures I administer a full dose of opium by the mouth or hypodermically. Dr. Bartlette quotes at length from Dr. James Lind, who I think first used opium as an abortifacient of intermittent paroxysms. He found it capable of aborting or mitigating

*Prof. Samuel M. Bemiss in Pepper's System of Medicine, Vol. I, p. 594.

the paroxysm very greatly. Taken at the beginning of the cold stage, opium will abort a great many cases, and all will be favorably modified. My experience has fully convinced me that opium given before the beginning of a paroxysm, or just at its incipiency, aborts the attack, or abbreviates it and relieves the distressing symptoms of the second stage, while the patient recovers from the febrile attack with much less exhaustion and depression. When I am able to see my patient just as he has begun to experience those peculiar prodromic symptoms, and exhibit a full dose of opium, the chances are decidedly against the development of the chill. So given, in seventy-five per cent of the cases which I have noted, the paroxysm failed to appear. When given later in the cold stage, opium will greatly mitigate the attack and contribute largely to our patients' comfort in the succeeding stages. When we find our patient in the cold stage of the fever, which is more protracted or severe than the former paroxysms, dependence should be placed upon chloroform in preference to opium. Dr. A. P. Merrill, of New York, one of the first to call attention to this manner of treatment, found chloro-

form a most efficient agent in intermittent paroxysms. I have found it all he and several other enthusiastic advocates claim for the treatment. I rarely use it, however, when the paroxysm is light, but reserve it for those cases which border on the pernicious forms of this fever. I usually administer it in doses of one dram in emulsion. Even when the cold stage has advanced considerably, the abortive energies of chloroform generally display themselves. If a single dose fail, I have no hesitancy in repeating it in forty minutes. The second dose usually succeeds in producing sleep. This is followed sometimes by a small rise in the temperature, but I have never seen it attain a higher degree than 101° F. Whisky and stimulants given in the cold stage are not only worthless but attended with danger. Prof. Bemiss has seen convulsions occur from brandy taken in the cold stage to abort the paroxysm.

Treatment of the *hot stage* is very often imperative. It is frequently complicated with excessive gastric irritability, more or less cerebral congestion, delirium, etc. The febrile action often runs to a dangerous point, and this will demand treatment. For the protracted vomit

ing which often occurs, oxalate of cerium was in a great many cases successful; I order it in five-grain doses repeated hourly. When this alone fails I order cracked ice as an adjuvant. Yet there often occur cases in practice which will not yield readily to any treatment. These are sometimes cured by hydrarg. chlo. mit., in doses of one half grain, repeated hourly or every half hour. When this fails I use dry cups, applied over the epigastrium, and give hypodermic injections of morphia, and generally this troublesome symptom subsides. For the headache and threatened or incipient cerebral hyperemia, I order bromide of potassium in doses of from thirty grains to one dram, repeated if necessary in four hours. This has succeeded in a large percentage of cases in relieving the symptoms referable to the cerebrum. It is advantageous, as soon as there is any headache, to apply cloths wet with cold water to the head. The comfort of the patient may also be increased by sponging the body with tepid water. The patient should be laid on his abdomen, and the posterior surface of the body sponged well and wiped dry, the anterior surface of the body is to be then treated in like manner. I fre-

quently, when the temperature of the patient is high, gradually lower that of the water until it is as cold as ordinary well-water. When the temperature is very high, above 107° F., the cold bath is indicated and should be used. But this should not be understood to apply to all cases; some patients, especially the very weak, nervous or cachectic, should not be subjected to the cold bath, as the shock will often prove too powerful for them.

The late Professor Bemiss says, "There are four different circumstances, each of which, in my opinion, calls for the exhibition of quinine during the hot stage, whether the fever has reached its maximum point or not: (1) If the period which has elapsed since the beginning of the paroxysm is so considerable that further delay might prevent sufficient cinchonism to intercept the next accession. (2) When the fever is so excessive that quinine should be given as an antipyretic. (3) When apprehension exists that the fever will occasion some accident or complication. (4) When the tongue is clean and the state of system favorable to absorption. To the *first* of these postulates I assent only conditionally. When the hot stage has con-

tinued from twelve to sixteen hours, all practitioners will agree that it is the best practice to begin the administration of quinine without waiting longer for the intermission. But the propriety of calling a case, in which the fever has persisted so long after the cold stage, an intermittent seems decidedly questionable It is possible for the hot stage to continue four to six hours, but when the period is extended to the length mentioned above (and this seems a fair inference from Dr. Bemiss' words), almost all Southern practitioners would diagnosticate the case remittent fever. To the *second* postulate I agree. But my experience with antipyrine is such that I prefer it to quinine. When the temperature mounts higher than 107° F., I unhesitatingly prescribe it in all cases where the cold or temperate bath is not used. In doses of from thirty to fifty grains it reduces temperature more surely and more promptly than quinine. The disagreeable effects of cinchonism too are in favor of the choice of antipyrine. Antipyrine has been recently extolled as a remedy for headache. Its claims, so far as my experience has gone, have a just foundation, and this increases its applicability in the treatment

of the second stage. But with his *third* indication I can not fully agree. I can not be brought to look upon quinine as the remedy for all the accidents or complications of the hot stage. When its action is called for it is applicable, but for cerebral hypermia or intense headache or convulsions it will be out of place. They demand other remedies, and quinine can not be depended on for their relief. Antipyrine more nearly fills this indication than quinine, because it readily lowers the temperature, and I frequently resort to it. The advisability of giving quinine during the hot stage is Prof. Bemiss' *fourth* indication. I can not see the importance of giving quinine in the hot stage for its antiperiodic effect in warding off the next paroxysm. Prof. Bemiss admits that the dose necessary is larger, and if the stomach would tolerate it, I contend that it would not be advisible to administer quinine so soon. It has not proved more valuable as an antiperiodic when given in the hot stage. It very frequently is not absorbed when given at this time. It has in a large proportion of my cases produced vomiting. Then we have not gained any thing if we prevent the recurrence of the next paroxysm, be-

cause the drug given in the interval would produce the same effect without the risk of incurring unfavorable results, such as emesis. As to indications for *treatment* in the *sweating stage*, little is called for except to keep the patient free from draughts or undue lowering of the temperature. Relative to the advisibility of administering the antiperiodic in this stage I shall speak when dealing with the means of preventing a recurrence of the paroxysms.

The means of preventing future paroxysms. It would be interesting to go over the literature of the treatment of intermittent fever, especially so would it be to deal at length with those agents which have, from Hippocrates down, been used to intercept intermittent paroxysms. Such a review, however, would be foreign to the purposes of this article, and I shall, therefore, only give a brief outline of the modern treatment of this disease, comprised in the following: Narcotine is a drug which we have good authority for believing is a most reliable remedy in intermittent fever. It has been used with a large degree of success not only in India, but it has elicited warm testimonials to its virtues from American phy-

sicians.* But in the present-day therapeutics of this disease it can not be claimed that narcotine holds other than a historical place. This is not because its use was not attended with curative results, but because its administration is followed by very disagreeable effects. Dunglison says "it produces all the disagreeable qualities of opium."

Iodine in some cases is probably of value. Sternberg and other good observers have found its field of usefulness quite small. The late Prof. L. P. Yandell gave it a thorough trial at the clinic of the University of Louisville, 1879, and was led to consider it a very unreliable antiperiodic. His percentage of cures I can not recall, but they were by no means large, and the use of the drug in this capacity was abandoned. My own use of this agent has been attended with results that are against the antiperiodic virtues it is alleged to possess. I do not consider it a remedy that can be trusted. The percentage of cures in my cases has been very small; less than ten per cent.

The use of nitric acid, given three times daily in doses of ten drops diluted properly, has, in

*See Narcotine as a Substitute for Quinine: Dr. O'Shaughnessy, Maryland Medical and Surgical Journal, October, 1839.

the hands of Prof. W. A. Hammond, been followed with results that would recommend a more extended trial of this remedy. I have used it in ten cases with success, and regard it most applicable in those cases where the fever persists despite the fact that the patient has removed from the malarious district and gone through a succession of cinchonisms, the form which we commonly term intermittent fever due to habit.

Arsenic has long had a reputation in the treatment of this fever. It is often claimed that it is the most reliable agent when quinine fails. I have never employed it in doses of a half grain, as recommended by Morehead, to ward off the paroxysm, and the experience of the profession is now against its use in that manner. I have used it considerably in this disease, and agree with Sternberg, "that it is especially suited to the treatment of chronic malarial cachexia and on relapses due to secondary causes and occurring sometimes after exposure to malarial influences.* I am strongly of the opinion that arsenic is not an antiperiodic at all. The cases of intermittent fever reported as cured by arsenic were cases in which the

*Sternberg's "Malaria and Malarial Diseases."

fever persisted from the system having become depraved, and required the use of a tonic of the kind arsenic is. It is valuable in the treatment of the type of intermittent fever that is *habitual*, or when we have to contend with chronic malarial cachexia. It has never proved valuable in my hands until the malarial poison has been neutralized and the patient removed to a non-malarious district. In other words, it is in the condition of the system in which the malarial poison leaves the patient that the remedial effects of arsenic are seen to the most advantage. Just when it can be said that the malarial poison is neutralized, all are not agreed upon. I am accustomed to look upon this as accomplished after the patient has taken quinine for the period of a month after removing to a healthy district.

Arsenic is a tonic particularly well adapted to the treatment of cases of the depression of the vital forces which follow in the train of results from continuous saturation of the system by the malarial poison. It is undeniable that Morehead and others have prevented the recurrence of paroxysms by the administration of arsenious acid in doses of one half grain, but this does not prove that it is an anti-

perodic any more than any other drug which would impress the system in the same way.

Bartlette says, "In regions where marsh fevers are extensively prevalent there are many remedies and modes of practice, besides those already mentioned, which acquire a popular celebrity. Most of these produce a sudden and powerful impression either on the mind or the body, and in this way will frequently break up the disease."*

The truth of this sentence all practitioners have had occasionally an opportunity to observe. The action of doses of one half grain of arsenious acid in preventing a paroxysm is an instance fitting, because it could not do otherwise than impress the mind and the body very profoundly. The fact that there are no advocates of the practice of exhibiting this drug in such large doses with a view of preventing the return of a paroxysm is evidence that its antiperiodic powers are not what they were claimed to be. Again, the experience of all observers is that its chief use lies in the treatment of chronic chills.

Hertz, one of the greatest authorities on intermittent fever, seems to accord with the view that it is not an antiperiodic, but a tonic

*Bartlette's Treatise on Fevers, p. 440. Philadelphia, 1852.

suitable for the reinstatement of the system which has been run down by malarial poison. He says, "An important place in the list of remedies for malarial fever has long been accorded to arsenic. At the same time its efficacy is undeniably less than quinine, especially in fresh attacks of the fever, where its effects are either uncertain or entirely negative. On the one hand it is of value in cases where quinine fails, in old inveterate and frequently relapsing intermittents and in malarial cachexia, as well as in neuralgias, which afterward yield to arsenic alone when all other remedies have proven unavailing."*

M. Aran, a distinguished French physician, long ago published an article wherein he reported his success in stopping an intermittent by the external application of a liniment composed of ol. terebinth, three and a half ounces, and chloroform, one dram. The patient had resisted quinine, and, I take it, presented a case in which the paroxysms recurred from *habit.*†

It can not be reasonably doubted that a decoction of lemons will cure a certain percentage of cases of intermittent fever. It is

*Hertz in Ziemssen's Cyclopedia, Vol. II, p. 672.
†London Lancet, September, 1852.

recommended by Maglieri, that an entire fresh lemon be cut in slices and put into an earthen vessel with eighteen ounces of distilled water and boiled for two or three hours, till sixteen ounces remain. After standing all night this is strained and given to the patient, who is to swallow it at several gulps. It is insisted that this be continued for from ten to fourteen days. Granting this treatment to be as efficacious as other methods, the fact that a pint of as bitter a decoction as this is to be taken will be sufficient to condemn it. It is not to be expected that the lemon treatment can receive any extended recognition until the properties upon which its curative virtues depend are extracted and rendered easy of administration.

Peperine exerts a curative influence in some cases. There is reason to believe it is of use in that form which is thought to be a *habit*. It produces a stimulating influence which is agreeable, and it may be used in some cases of this type with confidence. I should not employ it alone, however, or in cases which retain malarial complications.

Dr. C. S. Taylor recently communicated to the British Medical Journal some uses of this

drug, which are valuable because they detail its use in several cases.*

Urine is used by the Russian peasantry, it is said, with a large measure of success.

Sodium chloride has been used with success in a number of cases by various observers.

I have used *Cornus florida* with an encouraging degree of success. It long ago had a reputation in the treatment of intermittent fever, but was, as many other remedies have been, almost abandoned. In four cases where quinine on account of idiosyncrasy was inadmissible I prescribed it in doses of one dram of the fluid extract, to be given for five hours before the expected paroxysm, or one dram every hour until four doses had been taken. For the nausea that it produced in one case I ordered the oxalate of cerium, and this disturbance promptly yielded. I have a considerable degree of faith in the virtues of this drug, and while I would not advise its use in cases where more potent agents are applicable, still cases present themselves in which it may be employed with advantage.

According to several observers eucalyptus is a remedy of merit. Hertz regards it as a

*An Abstract of this Paper; Medical and Surgical Reporter, October 9, 1886.

"cheap substitute for quinine." Some have thought well of its antiperiodic powers, while others have denied it to be an agent of worth in this particular. Its virtues seem to be questionable as regards their claims to antiperiodic qualities. It seems to me to be more a tonic than any thing else, and it has been used in the mild or *habit* type of intermittent fever more than any where else. Hertz says, "It seems to me to make a difference whether the cases are new or old. It would appear, according to my limited experience, that the remedy is more applicable to old protracted cases than in recent ones, therein resembling arsenic."*

My own experience with this drug has not been of a nature to test it thoroughly, and I can, therefore, add little to the knowledge of eucalyptus.

Phosphorus has been used by a provincial Russian practitioner with an encouraging degree of success.

James Currie, whose name will be luminous both in the annals of medicine and literature, first introduced water into the treatment of this and other fevers. Its field of useful-

*Hertz in Ziemssen's Cyclopedia, Vol. II, p. 671.

ness is now pretty well understood, and it is capable of rendering real service in given cases. It is useful when the fever is the *habit* type. I order the patients to take a cold shower bath an hour before the expected paroxysm. These baths should be followed with rubbing, and ought to be taken daily for two weeks. This mode of treatment in this form of intermittents in a limited number of cases has been successful.

The picrate of ammonia has recently been introduced by Dr. Martyn Clark, of India, who reported the results of his use of the drug to the London Lancet.* It was investigated in 1872 by Dr. Dujardin-Beaumetz, and a report of his trials of the drug was read to the French Therapeutical Society, but it seems to have received, up to the time Dr. Clark used it, little consideration, and even now it is scarcely known to the profession at large. In the last four years Dr. Clark has treated ten thousand cases with the "happiest results." Relative to the method of administration Dr. Clark says, "I usually give it in doses of from one eighth of a grain to a grain and a half four or five times a day, in pill.

*See Abstract of this paper in Med. Record, May 7, 1887.

Half a grain is a fair average dose. This given, the result is soon visible. In the majority of cases treated half-grain doses in the interval prevented the recurrence of the next attack, while, in about twenty per cent of patients, two or three attacks of the fever followed before the fever ceased." There is excellent reason why this salt, with the high indorsement it has received from the ablest therapeutists, should obtain a thorough trial.

It is much cheaper than quinine, and this alone makes it worth a trial. My own experience with this agent is scarcely begun, I therefore can say nothing from actual observation.

There is little reason to expect much from carbolic acid. Reports placing its antiperiodic properties in a bright light are not to be taken to mean always what they say. Sternberg very truly says, "The history of medicine shows that the ruling medical theory largely controls therapeutics, and it is not difficult to obtain evidence in favor of any remedy which may be suggested, especially if its supposed mode of action accords with the experimenter's views relating to the etiology of the disease he proposes to cure." It is not improbable that the sup-

posed germicidal qualities which carbolic acid was supposed to possess and the recent progress in bacteriology gave rise to the thought that it might be a remedy of power in this disease. Sternberg and other great observers have found it almost worthless as an antiperiodic. My own uses of the drug have led to a like conclusion.

Salicylic acid has also proved worthless in this disease in my hands. Coffee is another article one comes across in the literature of intermittent fever. It has received the indorsement of several earnest writers, yet there is no good reason to attribute antiperiodic virtues to it. Professor Palli, of Milan, found the sulphite of magnesia to be of value in the treatment of this disease. The late Professor Flint found it, after a thorough trial, wanting, and other observers have had like experience.

In colocynth we have a remedy suitable in cases attended with marked biliousness. The comp. ext. of colocynth I have used in that type of intermittent in which we have a furred tongue, mild icterus, constipation, etc., and have found it decidedly efficacious. I frequently order it in combination with the mild chloride of mercury.

The remedy which justly claims at the hands of the profession more esteem, and having the widest range of usefulness, beyond question is quinine and the other alkaloids of the cinchona barks. Sternberg regards it as a specific but not as an antidote. Other therapeutists have agreed in attributing this high quality to quinine. There are excellent reasons for regarding quinine as the most potent of remedies in the greatest number of cases, but the fact that it does not cure all cases is generally admitted. I will admit it to be specific in one type of the cases, and even an antidote, but still there is a large class of cases that will not yield to it in any dose administered in any manner. Those who have had the best opportunity to observe the capabilities of this drug, as, for instance, the late Professor Bemiss, of New Orleans, declare the measure of its utility not to extend to all cases by a large percentage. It is also a fact attested by the experience of practitioners whose practice has brought them face to face with a large number of these cases.

Sternberg thinks it is mostly in localities where malarial diseases are little known and "pseudo-malarial diseases prevail" that quinine's specific

qualities are not appreciated, yet I believe the best estimate of the drug is put upon it in malarial regions. There its failure is more generally felt and acknowledged. Further, relative to the use of quinine in intermittents, Sternberg says, "Nevertheless, it must be admitted that persons exposed to malarial influences and those who have repeatedly resorted to the use of quinine seem to acquire a certain degree of tolerance to its action, and in such cases its specific virtues sometimes fail to manifest themselves.* He (Sternberg) advises that the deficiency on the part of quinine must be made up by enlargement of the dose. I have found that cases which have persisted in spite of quinine in moderate doses would not as a rule yield to the drug in larger quantities; yet when the doses are too small at the start this is possible. When the fever persists, in spite of the fact that quinine in doses of twenty grains has been given in the interval, it can be safely concluded that the indications for the treatment can not be supplied by quinine alone, at least my experience justifies this position. But it is not possible to discuss the relative fitness of these agents until we have defined several con-

*Sternberg, Malaria and Malarial Diseases, p. 107.

ditions, or indications, upon which depend in a large degree the success of any plan of treatment.

The sulphate of quinidia and cinchonidia are drugs of antiperiodic virtues equal in every respect to quinine. Some years ago I tested the relative merits of quinine and cinchonidia and found them to possess, as nearly as I could observe, equal antiperiodic powers. Cinchonidia in these experiments was given in the same dose as quinine.* It is a custom with me now to use cinchonidia in all cases where the patients are poor. This drug now sells for fifteen cents an ounce, and of course will be considerably less expensive than quinine in prescriptions, and should therefore be used in cases where cheapness is of importance to the patient. The sulphate of cinchonia is also a valuable antiperiodic, second only to cinchonidia in virtue. It is nauseating, however, and, owing to the great cheapness of the kindred salts, it is not likely to have extensive employment.

Salicin I have never used to any extent, and the evidence of its value in this disease is of a doubtful nature. So, also, are we to regard gelsemium and many other drugs. They pos-

*Notice of these experiments in Medical Herald, July, 1882.

sess possibly some feeble antiperiodic powers or exert their curative energies by action on the nervous system.

Treatment directed to the interception of subsequent paroxysms in the different types. The experience of all who have treated any extended number of cases of intermittent fever is that it is of the greatest importance to prevent another return of the chill. Not only is this important because it saves the patient the consequent exhaustion of the attack, but, as Flint says, "of the possibility of an intermittent fever at first simple or ordinary becoming after several paroxysms pernicious."

While the paroxysms may be essentially alike and have their origin immediately or remotely in the same cause, the practitioner is confronted daily in practice with *several distinct types of this fever*. In other words, we constantly meet cases in which, while they are alike as to form, there are symptoms and conditions of the system accompanying the one that are wanting in the other, and measures that will speedily cure in one case will utterly fail in another. It is one of the primary objects of this article to define as clearly as possible the symptoms and conditions which constitute and dif-

ferentiate these types. My experience leads me to look upon intermittents of the quotidian, quartan, or any variety, as assuming according to the state of the system four different types, and the treatment to be largely successful in warding off future paroxysms must be adjusted on the basis of this differentiation of the types. Intermittent fever is no more necessarily the same in two or three cases in practice than so many cases of pneumonia or typhoid or scarlet fever.

The types of intermittent fever met with in practice may be classed in this order: (1) That which is attended with that condition known as "biliousness" in its most marked form. Plus the fact that the patient has had an intermittent paroxysm, "the complexion is muddy, the conjunctivæ are yellow, the tongue is heavily coated with a yellowish-white fur, a bitter taste persists in the mouth, the breath is heavy in odor, even fetid."* There is generally a disgust with food and more or less obstinate constipation. If the bowels have acted, they have generally done so imperfectly, and the dejections are clayey or yellow in color. There is frequently retching and vomiting.

* The words in quotation marks are from Bartholow in Pepper's System.

Vomiting is very often an annoying symptom. This type I have observed occurs *only* in those patients who have resided in *very* malarial districts, those who live close to stagnant streams or pools, or near the banks of a river which is low or overflows and inundates the adjacent lands. It seems that malaria formed in a locality of this kind is necessary to the production of this type. This type of intermittent fever formed ten per cent of the cases of which I have notes. (2) The second type is that one in which the accompanying symptoms of "biliousness" may be present, but to a much less extent, or even, as they often are, entirely absent. The tongue is usually more or less coated, though it is many times perfectly clean. The bowels are generally constipated, but frequently it is only to a slight extent, and sometimes there is diarrhea with a red "beefy" tongue. The muddy complexion and other symptoms of the preceding type may be present in a less marked manner. The patient generally gives a history of malarial exposure, though he is often unable to make it out, and as a rule he has not been subjected to as virulent a degree of poison as the class who present cases of the first-named type. The febrile action in the hot stage will run as

high, and the other stages will present no distinctive differences from ordinary intermittent fever, only that the first-named type may be attended with more gastric irritability and other symptoms of "biliousness." This type is the one ordinarily met with in practice. (3) The third type is where the paroxysms have persisted long and the patient has malarial cachexia. The patients are those who have been exposed to the action of the malarial poison for a long period, and who have had paroxysms regularly in some cases for six months and a year. The patients are anemic and usually have enlargement of the spleen and liver, with more or less dropsy. There is often bronchitis and diarrhea, and this type has been mistaken for phthisis. The paroxysms are often masked, the cold stage is frequently but feebly expressed, and sometimes omitted entirely. The patient suffers from neuralgia and gradually becomes weaker until he succumbs, unless the treatment is successful.

The fourth type is the one in which the paroxysms seem to recur from *habit*. Its history is one usually marked by more or less continued exposure to the poison and neglect to employ remedies in proper time and manner. The patients are generally more or less ane-

mic, but present nothing like the depraved physical condition of those having malarial cachexia. It is seen mostly in those persons who have undertaken to treat themselves, or have resorted to the various nostrums until the system has become impoverished to a degree, and when the physician orders quinine taken in the interval he finds it unavailing. Even after removal to a healthy neighborhood the chills will recur.

While in this connection it will not be out of place to speak of the importance of satisfying one's self that the patient has intermittent fever. Chronic pleuritis, hepatic abscess, abscesses, hysteria, hectic fever, and other diseases simulate intermittent fever very closely. Professor Andrew H. Smith, of New York, recently reported a case of malignant endocarditis which simulated intermittent fever very closely.* Graves, in his Clinical Medicine, lays particular stress on the importance of diagnosticating intermittent fever, and details a case of hectic fever which had been been denominated intermittent fever by several able practitioners of that day.

In the *treatment of the first type* of cases

* See Medical Record, July 30, 1887.

nothing is so important as the timely administration of the compound extract of colocynth alone or in combination with calomel. Without regard to the time of the next recurrence of the paroxysm, I usually give it in doses of from ten to fifteen grains, repeated every eight hours, till the tongue has cleaned off and the symptoms of biliousness have entirely disappeared. Should the paroxysms recur after this has been effected, quinine will have to be resorted to. But it is not, according to my experience good practice to give quinine at the beginning in this type of cases. I have never seen a case that was clearly defined of this type that would not readily yield to this treatment. When gastric irritability complicates this type the mild chloride of mercury should always be combined with the colocynth, otherwise it is not always necessary.

In the second type of cases we are called to treat the ordinary expression of the malarial poison. This is the form in which quinine acts as a specific as much as any drug acts under the circumstances. Given properly it is almost an antidote. I have found it best to give the antiperiodic in five doses of four grains each, beginning six hours before the par-

oxysm is expected and given hourly until all five doses are taken. The last dose of the quinine will, of course, be taken an hour before the time that would be occupied by the chill. I have no reason for believing that the antiperiodic virtues of quinine are exhausted by giving it in one large dose, as Hertz and others advise. I order the antiperiodic taken as stated above for three consecutive days. It is given with advantage in this manner over the practice of giving what we consider the antiperiodic quantity any time in the interval. One reason is that during the time quinine is being taken we can keep the patient indoors till the time of the chill has passed, while, if it is taken in the sweating stage, the patient might go out, unduly expose himself, and bring on the paroxysm. Then, given in this manner, we are more assured that the malarial poison is neutralized; besides, the production of cinchonism for three consecutive times will make the chances for the return of the chill almost inconsiderable. The experience of several great observers would seem to confirm this position. Professor Flint declared the chances that cinchonism produced in the interval would ward off a recurring at-

tack was about equal with failure. It would seem that Professor Loomis favors this plan of producing several cinchonisms. He says, "Having prevented the recurrence of a second paroxysm, it is important that a moderate degree of cinchonism should be maintained for a number of days by the daily administration of quinine, in moderate doses, about two hours before the time of day at which the first paroxysm occurred; ten to fifteen grains should be daily administered."* I have found the antiperiodic given in the sweating stage often produced vomiting. But granting that it will not produce even nausea, the fact that the patient might go out and bring on another paroxysm is sufficient, together with the fact that no advantage would be gained, to condemn the practice. Since I have begun to give the antiperiodic later in the interval my success has been greater. My experience has led me to the conclusion that quinine given in solution is not more certainly antiperiodic. Fluids, it is well known, are more easy of absorption than powders, yet we are not on this score to ignore making our prescriptions palatable. The exhibition of quinine in capsules is

*Loomis' Practice of Medicine, p. 116.

a practice open to no objection if they are soluble. I have never had cause to regret using the drug in this manner. To give it in freshly made pills is also a good way. When the stomach is irritable I order two grains of oxalate of cerium with each dose of quinine. When the agent is to be given to children, I have ceased prescribing it any other way than in the aromatic syrup of yerba santa when it can be taken by the mouth at all. It completely disguises the taste of the drug and makes it so palatable that children like it. When it is not advisible on any account to give it *per os* or *per enema* it can be given hypodermically with advantage. Given in doses of six grains hypodermically, I have found it equal to twenty taken *per os*. When there is furred tongue and other symptoms of biliousness, colocynth and calomel should be added to the treatment.

Sternberg ascribes the oxytoxic powers often attributed to quinine to a misconception. I have often given women advanced in pregnancy full doses of quinine, and have never had the least reason to regard it as an abortifacient. Malarial fevers often produce abortion, and this is how the drug came to be looked upon

as an exciter of uterine contractions. *Cornus florida* (dogwood), given as before outlined, may be used. So also may the kindred alkaloids of cinchona and the remedies mentioned above. Fifteen or twenty grains of the bromides of potassium or sodium given during the time quinine is being taken will entirely relieve the unpleasant effects of cinchonism, such as tinnitus aurium, etc. This also lessens the tendency to nausea and vomiting. Such good results follow it that I almost follow giving it in a routine way, and never fail to give it when the patient complains of the unpleasant effects of cinchonism.

In the third type removal from the malarial surroundings is imperative. The patient's general health must be looked after. Cod-liver oil, arsenic, and iron are the remedies which will afford the best results. Diarrhea, bronchitis, and whatever complications may exist, will demand special interference suitable to the particular case and not possible to outline here. Arsenic should be given until the symptoms of arsenical poison in the edema arsenicalis appear. Quinine should be directed against the chills or elevations of temperature for one month, if that long be necessary to dissipate them.

The fourth type, which is seemingly *habit*, calls for treatment somewhat different than the other varieties. There are several remedies which render us substantial good in these cases, and which may be relied on with confidence. The patients should be put on tonics, such as iron. I frequently prescribe tr. ferri-chlor. in combination with liq. arsen. chlor. with the most satisfactory results. The best means to arrest the paroxysms are those agents which impress the nervous system. The bath of cold water is an excellent measure, used as above directed. Opium in full doses, one hour before the expected paroxysm, is one of the surest means of curing this form. It is well often to combine capsicum or piperine with the opium. Opium should be given for at least three consecutive days, or may be longer.

When the chills recur every fourteen or twenty-one days, quinine in doses of five grains, given for a period of four weeks, generally succeeds in my hands in curing them.

For the enlargement of the spleen nothing is so good as tonics and the application of the ointment of the biniodide of mercury over the site of spleen.

LOUISVILLE.